(29) $y = \sqrt{2}\cos x$

$y' = -\sqrt{2}\sin x$

$y' = -\sqrt{2}\sin\left(\frac{\pi}{4}\right)$ at $x = \frac{\pi}{4}$

$y' = -\sqrt{2} \cdot \frac{\sqrt{2}}{2}$ at $x = \frac{\pi}{4}$

$m = -1$

tangent $\Rightarrow$ $y = -\left(x - \frac{\pi}{4}\right) + 1$

Normal $\Rightarrow$ $y = \left(x - \frac{\pi}{4}\right) + 1$

(30) $y = \tan x$

$y' = \sec^2 x$

$\sqrt{2} = \sqrt{\sec^2 x}$

$\pm\sqrt{2} = \sec x$

$\sec^{-1}(\sqrt{2}) = x$

$\cos^{-1}\left(\frac{1}{\sqrt{2}}\right) = x = \frac{\pi}{4}, -\frac{\pi}{4}$

$y = 2x$

slope = 2 parallel need $m = 2$

(10) $y = \dfrac{\cos x}{1+\sin x}$

$$y' = \frac{(1+\sin)(-\sin x) - (\cos x)(\cos x)}{(1+\sin x)^2} \Rightarrow \frac{-\sin x - \sin^2 x - \cos^2 x}{(1+\sin x)^2}$$

$$= \frac{-1(\sin x + \sin^2 x + \cos^2 x)}{(1+\sin x)^2} \Rightarrow \frac{-(\sin x + 1)}{(1+\sin x)^2} = -\frac{1}{1+\sin x}$$

(9) $y = \dfrac{\cot x}{1+\cot x}$

$$y' = \frac{(1+\cot x)(-\csc^2 x) - (\cot x)(-\csc^2 x)}{(1+\cot x)^2}$$

$$y' = \frac{-\csc^2 x - \cot x \csc^2 x + \cot x \csc^2 x}{(1+\cot x)^2} = -\frac{\csc^2 x}{(1+\cot x)^2}$$